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①⑨ ①① **CANADIAN PATENT** ①②

⑤④ BLADE STRUCTURE IN A STICK FOR USE IN ICE-
HOCKEY OR AN EQUIVALENT GAME

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No. OF CLAIMS 7

ABSTRACT OF THE DISCLOSURE :

Blade structure in a stick for use in ice-hockey or an equivalent game, wherein on both sides of a blade's core part reinforced plastic layers having a length at least substantially equal to that of the whole blade have been laminated and which are covered by protective layers of wood veneer or equivalent material. The core part of the blade consists of an integral core piece consisting of wear-resistant plastic material, the core piece provides edgings resistant to wear and to impacts on the upper and lower edges of the blade of the stick.

The present invention relates to a blade structure in a stick for use in ice-hockey or an equivalent game.

Blade structures of the same type are already described in Canadian patent application 215,802, in the name of the same inventor, filed December 11, 1974, wherein it is taught that on both sides of a blade's core part reinforced plastic layers having a length at least substantially equal to that of the whole blade are laminated and which are covered by protective layers of wood veneer or equivalent material.

10 It is thus understood that the present invention concerns a result of further development of the stick blade disclosed in the Canadian patent application 215,802. The stick blade of the present invention may also be used in connection with stick shaft structures other than those specifically disclosed in the application 215,802.

Regarding the relevant state of art reference is made to the Finnish Patent No. 42 515, which discloses a stick substantially characterized by the feature that it is composed of core pieces serving to provide the dimensions of the stick in its thickness direction, of reinforced plastic laminations 20 disposed symmetrically on both sides of these core pieces and having a length equal to that of the whole structure, and of wood veneer layers constituting a protection of the latter. Experience gained in practice has revealed that sticks according to the said patent possess high-class strength characteristics. However, the weakest point of this stick has proved to be the lower edge of the stick's blade portion, which is subject to wear. The upper edge of the stick blade is also susceptible to damage. As an indirect consequence of the wear of the lower 30 edge the reinforced plastic laminations, which are essential in view of the strength of the stick structure, tend to be torn off the core piece, causing destruction of the stick's blade part.



An object of the present invention is to provide a blade structure which eliminates the above-mentioned drawback.

Another object of the invention is to provide a blade structure which simplifies the manufacturing of the stick so that no core parts necessitating separate attachment of the blade of the stick are needed.

In accordance with the invention, these objects are achieved by a blade structure comprising an inner core and outer layers of reinforced plastic laminated onto substantially the entire surface of both sides of the inner core wherein the inner
 10 core of the blade consists of integral piece made of wear-resistant plastic, preferably of thermoplastic material such as ABS plastic, which extends over the entire length of the blade beyond the edges of the reinforced plastic layers so as to provide the upper and lower edges and the tip of the blade with edgings resistant to wear and impacts.

The present invention will be better understood with reference to the attached drawings, wherein:

Fig. 1 represents a non restrictive embodiment of a
 20 stick blade according to the invention seen from the side, the core of which is overlayed with protective layers;

Fig. 2 shows on full-size scale a cross-section of the stick blade shown in Fig. 1 along line II-II;

Fig. 3 shows on full-size scale a cross-section of the stick blade shown in Fig. 2 along line III-III.

The core (central part) of the stick represented in Fig. 1, which core serves to give the blade of the stick its appropriate dimensions but otherwise has no substantial effect on the strength of the blade, consists of one integral core piece 10.
 30

In Fig. 1 the reference numeral 14 indicates the core piece of the stick shaft, the design and structure of which is not relevant from the viewpoint of the present invention. For

the purpose of joining the shaft and blade together, the core piece 10 of the blade has an indentation confined by the projecting parts 10d and 10e. The core piece 10 of the is made of a thermoplastic material well resistant to wear, such as ABS (acrylnitrile butadiene styrene) plastic for instance, or of another equivalent plastic material. The core piece 10 tapers down towards its point 10c and towards its upper edge (Figs. 2 and 3).

10 Reinforced plastic layers 11 are pressed upon the core piece 10 on its both sides, these layers extending substantially over the length and breadth at least of the blade of the stick and possibly also those of the shaft 14. Upon the reinforced plastic layers 11 wood veneers 12 are affixed to protect the layers 11, in the same pressing operation. The wood veneers 12 may be replaced e.g. by equivalent plastic layers or by fabric coverings. The margin of the wood veneers 12 or of the reinforced plastic layers 11 has been indicated by the interrupted line 13 in Fig. 1.

20 At the step in which the blade is machined, care is taken that the reinforced plastic layers 11, which impart to the blade its strength, do not extend fully up to the lower edge 10a of the core piece 10, but that rather the wear-resistant material constitutes an integral bottom rail, which serves in all and any conditions as a wear-resistant sliding surface 10a between the blade and the ice, whereby the detachment of the lower edges of the structural reinforced plastic laminations 11 from the rest of the structure is prevented. In the same manner a plastic edging resistant to wear and to impacts is formed on the upper edge 10b of the stick.

30 It is thus obtained a structure wherein the different components of the structure operate in precisely outlined specific tasks each. The core piece 10, which has been made

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of a sufficiently durable and light material and one which is easy to machine and to shape, keeps the structural reinforced plastic layers 11 properly spaced for achievement of sufficient strength and rigidity of the stick. The plastic or wood courses 12 protect the reinforced plastic layers 11 against scratches and wear. The bottom rail formed by the lower part of the core piece 10 absorbs the impacts between the stick and the ice and protects the bottom of the blade against wear. The front and upper edges 10a, 10b of the core piece constitute and impact-resistant edging of the blade. It is furthermore essential that the wearing edge 10a, 10b of thermoplastic material extends over the whole length of the blade.

SUPPLEMENTARY DISCLOSURE

In the principal disclosure, it has been disclosed a blade structure comprising an inner core consisting of an integral piece made of wear-resistant plastic, preferably a thermoplastic material such as ABS plastic, which extends over the entire length of the blade beyond the edges of the reinforced plastic layers so as to provide at least the upper and lower edges of the blade with edgings resistant to wear and impacts.

10 It has now been found that the core of the blade structure according to the invention can comprise two or more pieces, provided that the piece or pieces of the core which extend over the entire length of the blade and beyond the reinforced plastic layers, are made of wear resistant plastic such as ABS plastic.

The blade structure according to the invention is therefore more generally characterized in that it comprises an inner core consisting at least one piece made of wear resistant plastic material, said piece made of wear resistant plastic material extending over the entire length of the blade and beyond the edges of the reinforced plastic layers so as to provide the upper and lower edges of the blade with edgings resistant to wear and impacts.

20 In the attached drawings:

Fig. 4 represents another embodiment of stick blade according to the invention seen from the side, the core of which is overlayed with protective layers;

Fig. 5 shows on full scale a cross-section of the stick blade shown in Fig. 4 along line, and

Fig. 6 shows on full scale a cross-section of the stick blade shown in Fig. 4 along line.

30 The various parts and/or pieces of the sticks represented in Figs. 1, 2 and 3 of the principal disclosure and Figs. 4, 5 and 6 of this supplementary disclosure respectively are identically referenced.

The core 10 of the stick represented in Fig. 4 differs from that of the stick represented in Fig. 1 in that it does not

consist of a single integral core piece but consists of two pieces 15 and 16 fitted together.

The piece 16 which extends over the lower edge, top edge and tip of the blade outwards the reinforced plastic layers 11, is made of wear resistant plastic such as ABS plastic.

The piece 15 which is surrounded by the piece 16 and thus does not extend outwards the reinforced plastic layers 11, is made of wood.

10 This arrangement is of particular interest since the presence of a piece of wood inside the core of the blade provides the blade with a better bending rigidity than the core made of a single all plastic piece while still providing the blade with a good resistance to wear and impacts.

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The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A blade structure for an ice-hockey stick or the like comprising an inner core and outer layers of reinforced plastic laminated onto substantially the entire surfaces of both sides of said inner core characterized in that the inner core of the blade consists of an integral piece made of wear-resistant plastic material said piece extending over the entire length of the blade beyond the edges of the reinforced plastic layers so as to provide the upper and lower edges and the tip of the blade with edgings resistant to wear and impacts.

2. Blade structure according to claim 1, characterized in that the inner core of the blade has a tip and at least two projecting parts forming together an indentation at the end opposite to said tip, said projecting parts tapering down towards their respective ends, and in that the stick has a shaft provided with a core which enters the indentation of the blade.

3. Blade structure according to claim 1 or 2, characterized in that the inner core of the blade tapers down towards its tip and its upper edge.

4. Blade structure according to claim 1, wherein the inner core of the blade is made of ABS plastic.

5. Blade structure according to claim 1, wherein the outer layers of reinforced plastic are covered with protective layers of wood veneer or equivalent material.

CLAIMS SUPPORTED BY THE SUPPLEMENTARY DISCLOSURE

6. Blade structure for an ice-hockey stick or the like, comprising an inner core and outer layers of reinforced plastic laminated onto substantially the entire surfaces of both sides of the inner core, characterized in that the inner core of the blade comprises at least one piece made of wear resistant plastic material, said piece made of wear resistant plastic material extending over the entire length of the blade beyond the edges of the reinforced plastic layers so as to provide the upper and lower edges and the tip of the blade with edgings resistant to wear and impacts.

7. Blade structure according to claim 6, wherein the inner core of the blade comprises a first piece made of wood and a second piece made of wear resistant plastic material, said first piece being inserted and fitted into the second one, said second piece surrounding the first one and extending over the entire length of the blade beyond the edges of the reinforced plastic layers so as to provide the upper and lower edges and the tip of the blade with edgings resistant to wear and impacts.



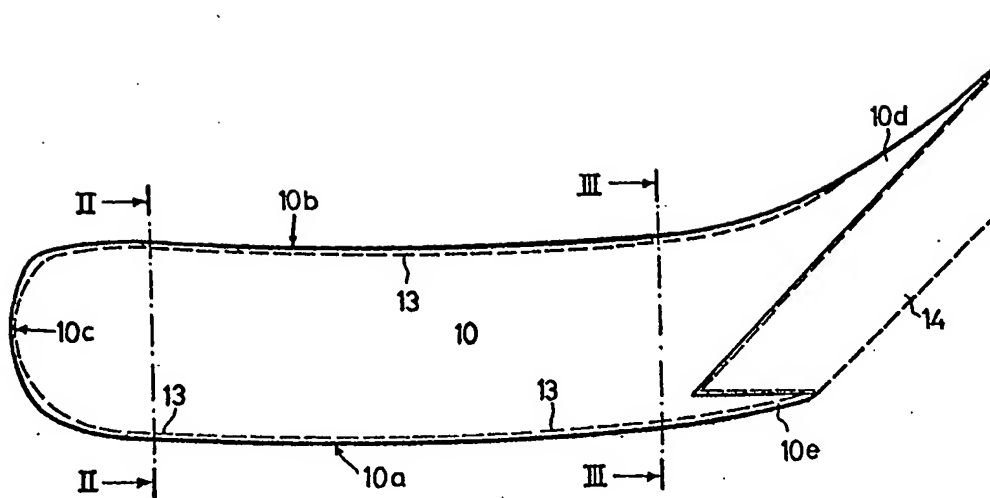


FIG. 1

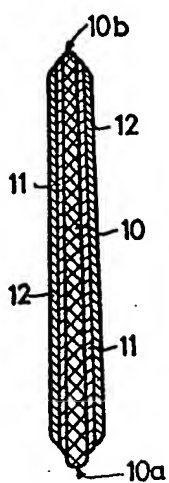


FIG. 2

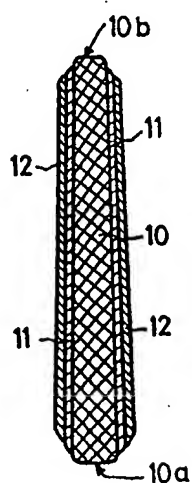


FIG. 3

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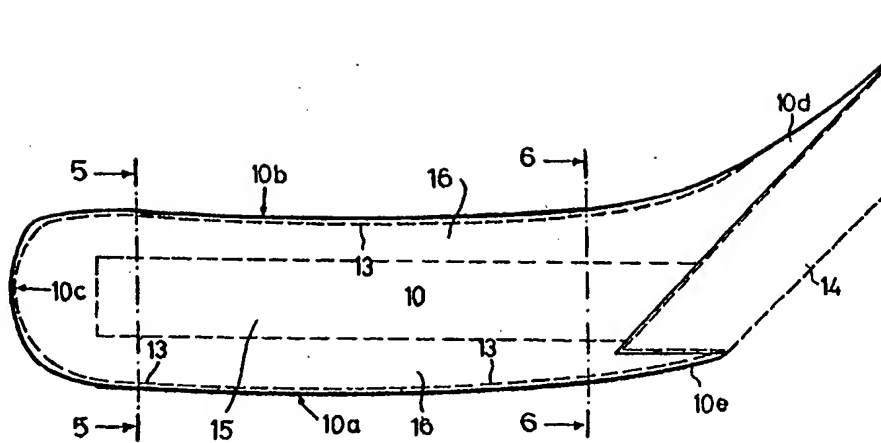


FIG. 4

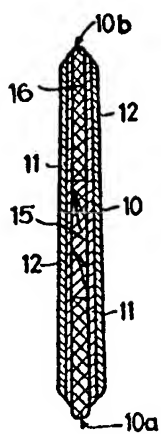


FIG. 5

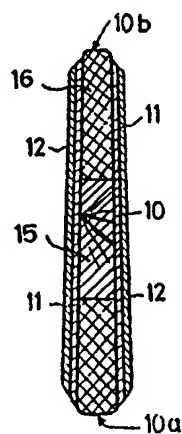


FIG. 6

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